Southwestern Forest Insect & Disease Bulletin

SOUTHWESTERN REGION
U.S. DEPARTMENT OF AGRICULTURE
FOREST SERVICE

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FOREST INSECT AND DISEASE CONDITIONS - 1975

Conditions in Brief

Increased moisture during 1975 brought an end to the drought conditions which existed in the Southwestern Region last year. Consequently, drought-associated ponderosa pine mortality decreased, but increased Douglas-fir mortality was observed in many areas, possibly a delayed response to the previous year's drought.

The greatest tree losses in the Southwestern Region were caused by bark beetles. A mountain pine beetle infestation on the Kaibab Plateau, Ariz., continued to develop, except on 4,500 acres where suppression logging significantly reduced beetle populations. Spruce beetle infestations developed on the Fort Apache Indian Reservation, Ariz., and Santa Fe National Forest, N. Mex., and are expected to intensify next year. A small spruce beetle outbreak on the Coconino National Forest, Ariz., was suppressed by logging infested trees. The roundheaded pine beetle caused considerable mortality to sub-merchantable ponderosa pines on the Lincoln National Forest and Mescalero-Apache Indian Reservation, N. Mex. The western pine beetle killed scattered mature ponderosa pines throughout the Region. Ips beetles caused widely scattered ponderosa pine mortality on marginal sites where stands had heavy dwarf mistletoe.

Defoliators increased noticeably in the Region, but tree damage and losses were minimal. Western budworm populations increased Regionwide and are expected to cause moderate to heavy defoliation in some Douglas-fir and true fir stands next year. Douglas-fir tussock moth infestations caused light to heavy defoliation on the Tonto National Forest, Ariz., and Cibola and Lincoln National Forests and in the cities of Santa Fe, Los Alamos, and Ruidoso, N. Mex. Chronic infestations of the western tent caterpillar continued over the Region, but were particularly severe on the Kaibab Plateau, Ariz. Southwestern pine tip moth continued to damage ponderosa pine regeneration on the Chevelon Ranger District, Ariz.

The dwarf mistletoes were the most destructive pathogens in the Region. Preventive and suppressive silvicultural measures against dwarf mistletoes were limited to commercial stands. Acute air pollution injury from SO_2 was observed near copper smelters in New Mexico and Arizona, but tree mortality has not been found. The status of other tree diseases is discussed in the text.

Status of Insects

Mountain pine beetle, Dendroctonus ponderosae Hopk. An infestation on the Kaibab Plateau, Kaibab National Forest, Ariz., continued in ponderosa pine stands during 1975. Suppression efforts to log infested trees prior to the July beetle flight effectively reduced beetle populations on 4,500 acres. However, new attacks increased markedly over about 8,000 acres of highly susceptible stands to the south and east of the logged area. A suppression project was initiated in this new outbreak center by logging infested trees prior to July 1, 1976. Scattered infestation centers were also detected in other portions of the Kaibab Plateau.

Mountain pine beetles attacked ponderosa pines pushed over during road construction on the Kaibab Plateau in 1974. Efforts were made in 1975 to determine if this attack behavior was unusual or whether downed trees were attractive to flying adults and broods will develop successfully in the logs. Pines were cut prior to beetle flight, and data collected on attack density and brood development. Preliminary results indicated that felled trees of all sizes (5 to 16+ inches d.b.h.) were highly attractive. Brood and attack data will be collected from these trees in 1976. A cooperative study with the Rocky Mountain Forest and Range Experiment Station also was initiated to collect data on the relationship of attack density and brood development with diameter of standing trees.

In northern New Mexico, widely scattered ponderosa pine mortality, due to this insect, was detected on the Carson National Forest and on private lands around Taos and Chama, N. Mex. This low-level mountain pine beetle infestation has existed for several years, and a similar trend is expected in 1976. Salvage logging was recommended.

Spruce beetle, Dendroctonus rufipennis (Kby.). An infestation covering about 75,000 acres in the Jemez Mountains, Santa Fe National Forest, N. Mex., was detected during aerial surveys. Scattered spruce blowdown triggered the infestation, perhaps with logging activity a contributing factor in some areas. The infestation is expected to intensify next year. Recommendations to conduct sanitation-salvage logging, in areas where it is economically feasible and environmentally sound, have been implemented.

Renewed spruce beetle activity was detected from the air in portions of the White Mountains, Fort Apache Indian Reservation, Ariz. Infestation centers are located in drainages where a recent outbreak (1968-1973) caused only light tree mortality. There are many susceptible trees present to support a renewed outbreak. Sanitation-salvage logging of infested spruce was recommended.

A small outbreak of spruce beetle in the San Francisco Peaks, Coconino National Forest, Ariz., was suppressed by logging infested trees and treating stumps. This infestation had developed in avalanche-damaged spruce. An area of infested spruce blowdown, concentrated in the Arizona Snow Bowl of the Peaks, also threatens surrounding stands in this high-use ski area. Decking and burning the infested material or using it for firewood was recommended.

An evaluation of the impact of spruce beetle infestations on timber resources was fully implemented during 1975. Permanent plots were sampled on two 300-acre survey tracts where spruce beetles caused substantial tree losses during recent years, and on one 300-acre tract with a current high infestation level. The first two tracts are in the Mt. Baldy Wilderness, Apache-Sitgreaves National Forest, and White Mountain Apache Tribal Wilderness, Ft. Apache Indian Reservation, Ariz. Losses totaled 16 and 10 spruce trees per acre, respectively, for each of these two tracts. The third tract is in the San Pedro Parks Wilderness, Santa Fe National Forest, where total spruce losses currently stand at 4.5 trees per acre, but the infestation is increasing.

Roundheaded pine beetle, Dendroctonus adjunctus Blandf. This insect continued to cause considerable ponderosa pine mortality in the Sacramento Mountains of the Lincoln National Forest and Mescalero-Apache Indian Reservation and intermingled non-Federal lands in southern New Mexico. Much of the tree mortality was in submerchantable-size stands. There appeared to be a direct association between tree susceptibility and site, stand density, drought stress, and dwarf mistletoe infection. Where large concentrations of sawtimber-sized pines were killed, salvage logging was recommended to utilize the tree resource.

A particularly intensive roundheaded pine beetle outbreak center in Silver Springs Canyon, near Cloudroft, N. Mex., is being investigated under a cooperative effort with New Mexico State University. Studies are underway to determine what factors predispose trees to attack and to test insecticidal sprays for the prevention and suppression of beetle outbreaks.

Western pine beetle, Dendroctonus brevicomis LeC. Widely scattered mature ponderosa pines were killed by this beetle throughout portions of the Apache-Sitgreaves, Coconino, Coronado, Prescott, and Tonto National Forests, Ariz., and Cibola, Gila, and Lincoln National Forests, N. Mex. Salvage logging was recommended where feasible.

Southern pine beetle, Dendroctonus frontalis Zimm. This beetle caused mortality to scattered Chihuahua and ponderosa pines in the Santa Catalina Mountains, Coronado National Forest, Ariz. About 125 MBF of beetle-killed trees were salvaged in 1974 and 1975.

Ips beetles, Ips spp. Ponderosa pine losses in the Southwest from several species of ips beetles decreased in 1975 compared to 1974. No large epicenters of mortality were observed. Scattered tree losses were detected throughout the ponderosa pine forest type in Arizona and New Mexico. Most of the tree mortality occurred on marginal growing sites for ponderosa pine where stands were heavily infested with dwarf mistletoe. Salvage logging of ips-killed trees was recommended where it was economically feasible and environmentally sound.

Often, when management activities (i.e., logging or timber stand improvement) are conducted in stands growing on marginal sites, resident ips populations can build up in the slash and threaten nearby trees. This situation occurred on the Walnut Creek Ranger District, Prescott National Forest, Ariz., where slash was infested with Ips lecontei Sw. This infestation was satisfactorily suppressed by covering infested piles of slash with clear polyethylene plastic to create temperatures lethal to the ips broods.

Western spruce budworm, Choristoneura occidentalis Free. Increased budworm activity was detected in the Region during 1975. Defoliation of Douglas-fir and true firs, as estimated during aerial surveys, totaled 9,843 acres (light = 6,760 acres; medium = 2,381 acres; and heavy = 702 acres). Host trees were defoliated on portions of the Kaibab Plateau, Kaibab National Forest, in Arizona, and the Carson, Santa Fe, Cibola, and Gila National Forests and Philmont Boy Scout Ranch in New Mexico. The 1975 egg mass survey indicated that populations will increase during 1976 in these areas and cause moderate defoliation to host trees. Locally heavy defoliation can be expected in a few areas.

A cooperative study was conducted with Rocky Mountain Forest and Range Experiment Station personnel to improve budworm egg mass sampling efficiency and precision. Sampling under ultraviolet light was compared with sampling under visible light to determine if foliage examination time could be reduced and if egg mass counting precision could be increased. Results indicated that ultraviolet light significantly increased sampling efficiency without affecting precision.

Douglas-fir tussock moth, Orgyia pseudotsugata McD. Defoliation of Douglas-fir and true firs was found in the Region during 1975. Heavy defoliation over about 50 acres occurred in the Manzano Mountains, Cibola National Forest, near Albuquerque, N. Mex. Low-level outbreaks were detected on the Lincoln National Forest in southern New Mexico and the Tonto National Forest in central Arizona. Chronic infestations continued in ornamentals (mainly spruce) in Santa Fe, Los Alamos, and Ruidoso, N. Mex.

A survey was conducted with sex pheromone-baited traps to determine more accurately the geographic distribution of the tussock moth in the Southwest. Results showed that this insect occurs in the mixed conifer forests of central and north central Arizona and throughout most of New Mexico.

Ground tests with Bacillus thuringiensis were conducted against the Douglas-fir tussock moth in Santa Fe, N. Mex., in cooperation with the Rocky Mountain and Pacific Northwest Forest and Range Experiment Stations. The efficacy of three commercial formulations, Biotrol® XK, Dipel®, and Thuricide® 16B, applied by hydraulic sprayer to ornamental Douglas-fir, white fir, and blue spruce, was evaluated. In this test, Thuricide® 16B gave the best control.

Western tent caterpillar, Malacosoma californicum (Pack.). Localized infestations of this moth were detected in aspen stands throughout the Southwest, but extensive defoliation was detected only in a few locations. On the Kaibab Plateau, Kaibab National Forest; on Navajo Mountain, Navajo Indian Reservation; near Mormon Lake, Coconino National Forest; in the Pinaleno Mountains, Coronado National Forest, Ariz.; and in the Black Range, Gila National Forest, N. Mex., tent caterpillars caused severe defoliation; however, most trees refoliated during late summer. Some branch mortality was observed on the Kaibab Plateau where an infestation has been epidemic for several years.

Southwestern pine tip moth, Rhyacionia neomexicana (Dyar). This insect continued to damage ponderosa pine reproduction on the Apache-Sitgreaves National Forest, Ariz., in 1975. Major infestations of the tip moth have persisted on the Chevelon Ranger District over 26,000 acres of regenerated burns since 1967.

In cooperation with Rocky Mountain Forest and Range Experiment Station, Regional personnel are analyzing the pine tip moth damage to the ponderosa pine resource (fig. 1). The most common types of damage were lateral pruning, crook, and bush, which comprised about 60 percent of the 5,000 internodes sampled. Data on individual tree height growth and infestation level, gathered since 1967, are being correlated with the deformity produced by destruction of lateral and terminal branches and buds.

Other insects. The large aspen tortrix, Choristoneura conflictana (Wlk.), severely defoliated aspen stands on parts of the Kaibab Plateau, Ariz., for the third successive year. A geometrid, probably the New Mexico fir looper, Galenara consimilis Hein., in association with the western spruce budworm and Douglas-fir tussock moth, contributed to severe defoliation of Douglas-fir and true firs over about 6,000 acres on the Lincoln National Forest, N. Mex. The smaller European elm bark beetle, Scolytus multistriatus (Marsh.), was detected throughout New Mexico and in Arizona for the first time using synthetic pheromone traps under a cooperative program with the Northeastern Forest Experiment Station at Delaware, Ohio. Forty-four pheromone-baited, sticky traps were used to survey for the elm bark beetle in

Fig. 1.--Types of southwestern pine tip moth damage to ponderosa pine reproduction: 1, Posthorn; 2, lateral pruning; 3, spiketop; 4, no damage; 5, crook; 6, fork; 7, bush.

eight New Mexico cities. This insect was caught in large numbers on all traps in Albuquerque, Deming, Espanola, Las Cruces, Las Vegas, Raton, Santa Fe, and Silver City. It is not known if the Dutch elm disease fungus occurs in New Mexico. Various unidentified species of pitch, twig, shoot, and tip moths are persistent problems on ornamental ponderosa and pinyon pines in urban and suburban areas. One species of Pyralid moth (Dioryctria sp.) caused widespread branch and tree mortality by its destructive cambial boring habit. The pitch nodule moth (Petrova sp.) was active on 1,200 acres near Thoreau, N. Mex., where it killed twigs and severely deformed pinyon. An unidentified tip moth caused heavy tip-kill of pinyon on 175 acres of a Bureau of Land Management recreation site near Questa, N. Mex., and on an additional 600 acres of pinyon near Ojo Caliente, N. Mex. The pinyon needle scale, Matsucoccus acalyptus Herb., continued to cause needle injury, tip-killing, branch flagging, stunting, and tree mortality over approximately 250 acres near the towns of Pecos and Questa, N. Mex. Nearly 2,000 acres of pinyon near Gallup, N. Mex., were moderately to heavily defoliated by the pinyon needle miner, Coleotechnites n. sp.

Status of Diseases

Dwarf mistletoes. Dwarf mistletoes, Arceuthobium spp., continued as the most destructive disease agents in the Southwest. Southwestern dwarf mistletoe, Arceuthobium vaginatum subsp. cryptopodum (Engelm.) Hawks. and Wiens, on ponderosa pine, and Douglas-fir dwarf mistletoe, Arceuthobium douglasii Engelm., again exerted the greatest economic impact in commercial timber stands of the Southwest. Silvicultural treatments to reduce the impact of these parasitic plants have continued. Emphasis has been placed on preventive silvicultural treatment of mistletoe in order to avoid creation of "untreatable" mistletoe-infested stands.

Post-control evaluations in several campgrounds indicated pruning of mistletoe-infected ponderosa pines was sound, silviculturally. Pruning was most successful when applied to lightly-infected trees.

Progress continued on implementation of the simulated yield program for dwarf mistletoe-infested ponderosa pine stands in the Southwest. Scientists from the Rocky Mountain Forest and Range Experiment Station have recently completed a revision of the simulated yield program, which alleviated many difficulties previously encountered. The revised simulated yield program (SWYLD2) provides yield tables for even-aged and two-storied stands of ponderosa pine in the Southwest. Effects of dwarf mistletoe are included in the yield simulation program although it may also be used in non-infected stands.

Field evaluations of the SWYLD2 program were completed on five National Forests in 1975 (Gila, Santa Fe, Apache-Sitgreaves, Coconino, and Kaibab). From several hundred to over 1,000 acres of even-aged ponderosa pine infested with dwarf mistletoe were surveyed in each Forest. Survey results indicate that the SWYLD2 program can be a valuable tool for the land manager. Use of the SWYLD2 program in two-storied stands will be evaluated in 1976.

Air pollution. Acute SO_2 injury to forest vegetation from copper smelter emissions was observed on the Apache-Sitgreaves National Forest, near Morenci, Ariz., and on the Tonto National Forest, near Miami, Ariz. As in previous years, neither trees nor minor vegetation have been killed by SO_2 fumigation. Acute SO_2 injury was limited to tipburn on conifers and interveinal bleaching and/or browning on broadleaf plants. Fewer species and plants/species were injured in 1975 than in previous years, probably because SO_2 emissions decreased as copper production has dropped in response to a slumping economy.

Aspen diseases. These pathogens caused defect and cull to residual aspen following selective logging on the Carson National Forest, N. Mex. A cooperative effort with Region 2 and Rocky Mountain Forest and Range Experiment Station to study this association between aspen diseases and logging practices was continued and expanded this year.

Rusts. Limb rust, Peridermium filamentosum Pk., remained at an endemic level in ponderosa pine forests of the Southwest.

Spruce broom rust, Chrysomyxa arctostaphyli Diet., and fir broom rust, Melampsorella caryophyllacearum Schroet., caused spiketops and bole deformation in many areas of the Region. Fir broom rust on white fir has been epidemic on portions of the Cibola National Forest for many years. Management of this disease has been hindered because of constraints on removing infected trees which are of value for recreation and wildlife uses.

Foliage diseases. These diseases remained endemic throughout the Southwestern Region in 1975. Several reports of Elytroderma deformans (Weir) Dark., on ponderosa pine were received from northern Arizona.

Lirula abietis-concoloris (Mayr ex Dearn.) Dark., was detected on white fir in limited areas of northern New Mexico.

An unidentified foliage disease, characterized by browning and curling of portions of the new growth, occurred in scattered locations throughout the Region. Douglas-fir, white fir, corkbark fir, Engelmann spruce, and blue spruce all exhibited these characteristic symptoms, generally early in the growing season, but little evidence of injury remained by late summer. Observation of this disease will continue in 1976.

Stem cankers. Cytospora chrysosperma (Pers.) F., on cottonwood was encountered frequently in Big Bend National Park, Tex. A program to reduce the impact of this disease on cottonwoods in the Park was developed and is being implemented.

Root disease. Armillariella mellea (Fr.) Karst., caused some ponderosa pine seedling and sapling mortality in portions of Arizona. Regionwide, this root rot continued to be endemic, often functioning as a natural thinning agent. A pine plantation, which sustained 2 to 7 percent tree mortality during 1971 and 1972, was found to be free of the root rot this year. Tree maturation and increased vigor may be responsible for the decline of A. mellea in the plantation.

Trunk and butt rots. Echinodontium tinctorium (E. & E.) E. & E., on white fir was frequently detected in mature to overmature white fir stands throughout the Region. Timely harvest of mixed conifer stands is essential to reduce volume losses caused by this fungus.

Volume losses attributed to trunk and butt rots of ponderosa pine sawtimber are being evaluated in various portions of the Region.

Drought stress. There was less ponderosa pine mortality this year than last which could be associated with drought stress, concomitant with dwarf mistletoe infection and/or secondary bark beetles. This type of mortality decreased because moisture conditions improved in most portions of the Region in 1975. However, an increase in Douglas-fir mortality was observed in submerchantable-sized stands throughout the Region. Secondary insects were found in some of the dying trees, but it appears that much of the observed tree mortality was a delayed response to the 1973-1974 drought conditions. Douglas-fir mortality was particularly severe on the Apache-Sitgreaves, Coconino, Kaibab, and Prescott National Forests, Ariz., and Gila and Lincoln National Forests and Mescalero-Apache Indian Reservation, N. Mex.

Salt damage. Chloride toxicity continued to affect roadside trees in the Cibola and Santa Fe National Forests, N. Mex. In the Cibola National Forest, salt affected primarily white fir, corkbark fir, and Engelmann spruce. Tree mortality on the Cibola National Forest was less during 1975 than the previous year, probably because less deicing salt was applied to highways. White fir and aspen were the primary tree species damaged by deicing salt on the Santa Fe National Forest. Attempts to alleviate the salt damage on this Forest are planned for early 1976.

Hail damage. A hailstorm caused severe defoliation of ponderosa pine over about 100 acres of the Jemez Ranger District, Santa Fe National Forest, N. Mex. Defoliation, wounding of twigs and branches, and terminal leader mortality were prevalent on affected trees. Reexamination of the area in late 1975 indicated tree mortality resulting from the hail damage was very limited. However, salvage logging in the overstory and thinning of heavily damaged understory trees were recommended to reduce the potential for insect buildup in weakened trees.

NEW MEXICO'S STATE FOREST ENTOMOLOGIST

Tony Smith is a forest entomologist working in a cooperative program between the New Mexico Department of Agriculture and the USDA Forest Service. Tony is responsible for forest insect and disease management on State and private lands in New Mexico. Tony is a native of Maine. He received a B.S. in Entomology from the University of Maine and a M.S. in Biology from New Mexico State University. He formerly was employed by the New Mexico Environmental Institute, and has lived in New Mexico for the past 11 years. Tony has been with the New Mexico Department of Agriculture for $2\frac{1}{2}$ years. His office is at 421 Gold Avenue, SW, P. O. Box 6, Albuquerque, New Mexico 87103, telephone (505)-766-3914

ARIZONA'S STATE FOREST ENTOMOLOGIST

Robert Celaya is the State forest entomologist hired under a Cooperative Agreement between the U.S. Forest Service and the Arizona State Land Department. Bob is a native of Arizona and received a B.S. degree in Zoology in 1972 from Northern Arizona University. He attended graduate school at Arizona State University, majoring in Entomology. He previously worked for the Western Cotton Research Laboratory in Phoenix. Bob began work in August 1975 on a program of forest pest detection and evaluation on non-Federal lands in Arizona. His address is Division of Natural Resource Management, Arizona State Land Department, 1624 West Adams, Room 419, Phoenix, Arizona 85007, telephone (602)-765-4626.

FOREST INSECT AND DISEASE MANAGEMENT ADP CAPABILITIES

With use of the USDA Fort Collins Computer Center UNIVAC and a 720C WANG programmable calculator to run several data summation programs, and a recently developed growth simulation program, the FIDM Staff Unit was able to increase its capability of making statistically valid data analyses on a timely basis.

The Forest Service-owned 720C WANG and the DENSUR program (developed by FIDM) were used to process the data collected on 1,600 pre-thinned ponderosa pine plots. The DENSUR output (average tree density, diameter, and percent of stand infected with dwarf mistletoe) provided the reliable estimates of stand parameters required as input to other programs, such as SWYLD(2), which simulate yields of ponderosa pine infected with dwarf mistletoe. Other WANG programs, the DM-SUPPRESS and ESB-IMPACT, were useful to our personnel in automating several routine but otherwise time-consuming calculations. These programs saved time (an average of sixfold) and insured accuracy of calculations compared to standard calculating machines. As an example, 44 hours of data entry were required to input the 1,600 DENSUR plots, and a permanent record of the data was obtained. On the other hand, an estimated 300 hours would be required on a non-programmable, non-printing calculator, and entry and rounding errors would go unnoticed. Without the WANG, statistical computations would be too time-consuming to be figured.

The versatile FORTRAN program NSEC was used to obtain data summaries and statistics for several surveys and from variable- and fixed-size plot data. NSEC calculated average number of trees per acre by diameter class for eight damage categories, plus five useful statistical estimators and total basal area for each of the eight categories. If a non-programming, limited memory desk calculator were used to summarize these surveys, about 500 additional hours of data manipulation would have been necessary to obtain comparable information.

A NEW TOOL FOR AERIAL SURVEY

FIDM has included aerial photographic capabilities to its list of evaluation techniques. The photography will be used mainly for systematic plot sampling in damage surveys. A motorized Hasselblad camera, 70 mm, 500/ELM, using a window mount developed by FIDM personnel, will be the main system used. Both color and color infrared film will be utilized, depending on the specific symptoms of dead and/or dying trees that need to emphasized. The film is exposed in stereo pairs and is interpreted with a Bausch and Lomb 240Z stereoscope. The transparent film is viewed on a light table through the stereoscope.

FOREST INSECT AND DISEASE DETECTION

The detection of forest insects and diseases is a two-part program. The first phase consists of field surveillance carried on by personnel on the District during their assigned duties. The second phase consists of aerial and ground detection surveys conducted by FIDM personnel. The importance of the first phase of the detection program cannot be overemphasized. Excellent opportunities for early detection of insect and disease outbreaks can be provided by District personnel. A District can assure a timely and accurate evaluation of the problem, which is vital if suppression is needed, by promptly reporting any unusual insect and disease problem to FIDM on form R-3 5200-5.

In 1975, 62 detection report forms (R-3 5200-5) were received by FIDM. In general, the information provided on the form was adequate for prompt and accurate determinations to be made. Some common errors consisted of not providing all possible information in the "General Information" and "Tree Damage Symptoms" sections--particularly the host tree species. Also, the "Remarks" section at the bottom of the form should be reserved for FIDM response. Additional comments about a particular problem were helpful to FIDM in making determinations. These comments should be included whenever possible, but they should be placed on a separate sheet of paper and attached to the back of form R-3 5200-5.

REMEMBER - PEST DETECTION IS FOR YOUR PROTECTION. Be alert! Please report promptly any new or unusual forest insect or disease outbreaks to the Forest Service, Forest Insect and Disease Management Staff Unit. Information concerning forest pest problems can most easily be reported on the Detection Report form (R-3 5200-5). A sample of this Detection Report form is shown on the next page. If you need additional information or forms, please write or give us a call at (505) 766-2440.

USDA—Forest Service

DETECTION REPORT
FOREST INSECT AND DISEASE DAMAGE

INSTRUCTIONS: After detection of any insect or disease activity, do the following:

(a) Immediately prepare detection report in triplicate.
(b) Send all three copies to the Regional Forester, Forest Service, USDA, 517 Gold Avenue, S.W., Albuquerque, New Mexico 87101.
(c) Pest Control will acknowledge, answer, and return your file copies.

PEST DETECTION IS FOR YOUR PROTECTION

Be alert. Report promptly any new or unusual forest pest to the Regional Forester (See FSM 5220).

Pest Control Branch USFS

Administrative Unit _____ (Forest, National Park, etc.)

Sub-Unit _____ (Ranger District, etc.)

Date of Observation _____

Observed by _____

Location of Damage (Attach ¼" scale map)

_____

_____

GENERAL INFORMATION

Host _____ Avg. d.b.h. _____

Size class affected:

- ☐ Seedlings
- ☐ Saplings
- ☐ Poles
- ☐ Sawtimber
- ☐ Overmature timber

Damaged standing stems/acre _____

Down stems/acre _____ (Blowdown, slash, cull, etc.)

Number of acres infested _____

Damage to:

- ☐ Single Trees
- ☐ Groups _____ (No. of) _____ (No. per)

TREE DAMAGE SYMPTOMS—(Check term(s) applicable)

Crown:
- ☐ Top
- ☐ Middle
- ☐ Lower
- ☐ Entire

Needles or leaves:
- ☐ Chewed
- ☐ Mined
- ☐ Webbed
- ☐ Spotted
- ☐ Discolored
- ☐ Missing

Tree foliage:
- ☐ Green
- ☐ Fading
- ☐ Sorrel
- ☐ Red
- ☐ Brown
- ☐ Black

Enclosures:
- ▱ Appropriate Maps
- ▱ Damage Samples
- ▱ Insect Specimens

Damage to:
- ☐ New Foliage
- ☐ Old Foliage
- ☐ Both

Tree bole:
- ☐ Cracked
- ☐ Sluffed bark
- ☐ Boring dust
- ☐ Pitch tubes
- ☐ Woodpecker feeding
- ☐ Canker
- ☐ Conks

Branches:
- ☐ Broken
- ☐ Swollen
- ☐ Discolored
- ☐ Cankers
- ☐ Mistletoe
- ☐ Girdled

Associated disturbance:
- ☐ Fire
- ☐ Logging
- ☐ Thinning
- ☐ Blowdown
- ☐ Insects
- ☐ Disease

Unusual weather conditions:
- ☐ Wind
- ☐ Rain
- ☐ Hail
- ☐ Sleet
- ☐ Snow
- ☐ Flood
- ☐ Drought

INFESTATION OR INFECTION CHARACTERISTICS

Insect(s) or Disease(s) if known _____ How long active _____

Status: Static _____ Decreasing _____ Increasing _____ Unknown _____

Remarks: _____

(FOR PEST CONTROL BRANCH USE ONLY)

Remarks:

Unisort Cards By _____ Date _____ Acknowledged By _____

R-3 5200-5 (Rev. 1/69)

FOREST INSECT AND DISEASE MANAGEMENT PERSONNEL

Staff Unit Director - Don Graham

Assistant Director for Insect Detection and Evaluation - Doug Parker
- Forest Insect Specialist - Bob Acciavatti
- Forest Insect Specialist - Gene Lessard
- Survey Specialist - Emmett Wilson
- Biological Laboratory Technician - Mike Chavez
- Forestry Technician - Nancy Olson

Assistant Director for Forest Diseases - Ed Sharon
- Forest Disease Specialist - Jim Walters
- Biological Technician - Brian Geils

Assistant Director, Cooperative Insect and Disease Control and Special Projects - Don Lucht

Clerk-Typist - Lester Putman

Additional information concerning this report or other forest insect and disease problems can be obtained by contacting the Forest Insect and Disease Management Staff Unit listed below.

USDA, Forest Service
State and Private Forestry
Forest Insect and Disease Management
517 Gold Avenue, SW
Albuquerque, New Mexico 87102

Telephone: (505) 766-2440